

Hydrogen Valley

Hans-Jørgen Brodersen, Project Manager/ 13-02-2017



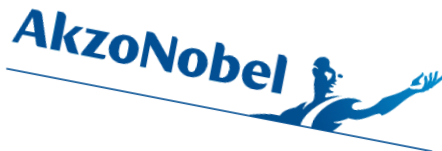
Who is Hydrogen Valley?

- Business fund
- We take *active* part in **the green transition** of the Danish energy system – turning visions into actions: projects and jobs
- We collaborate with private companies, public authorities and research institutes
- Non-profit organization – financed by the municipality of Mariagerfjord, the region in northern Jutland and project aids



Results created since 2002

- We have contributed to the creation of 150 jobs
- Collaboration with international companies
- Strong and growing collaboration with Aalborg University and other research institutions
- 30 m. € from funds invested in projects and activities within the FCH-sector



Focus areas

Hydrogen

- Expand and Support the demand of hydrogen for transport and for electrofuels.

Biogas and methanisation

- Establishing a biogas plant in Northern Jutland
- Producing synthetic methane, methanol ,DME or other synthetic fuels.

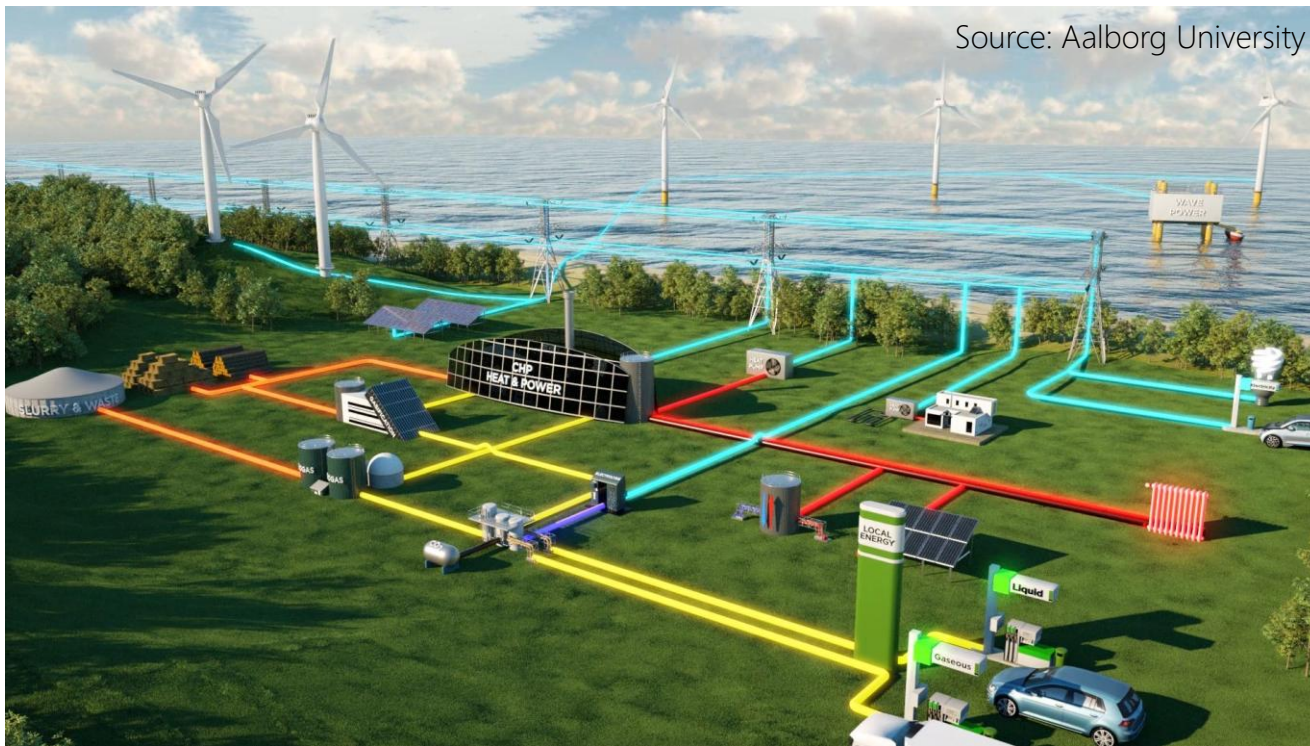
Salt caverns as storage

- The production of hydrogen and biogas will demand large scale storage in the future
- Salt caverns close to Hobro can be used as storage

H₂



The future energy system

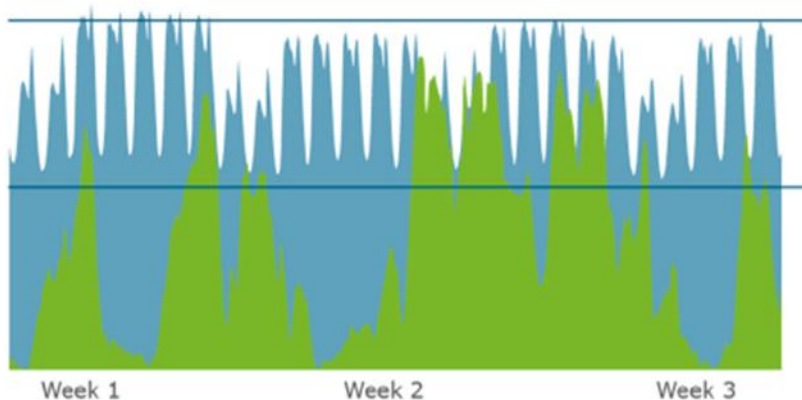


Why we support the HyBalance project?

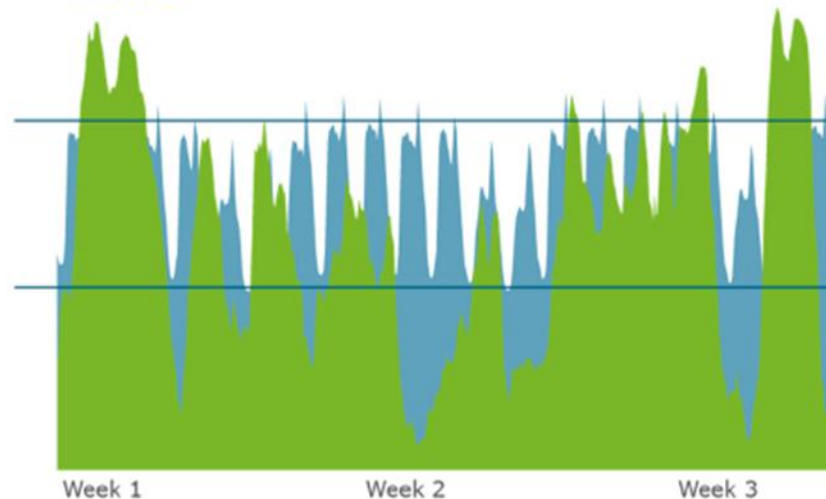
- Denmark is one of the countries in the EU with an ambitious energy policy.
- In 2012, a majority in the Danish national parliament adopted or confirmed an energy agreement stating that:
 - By 2020, 50% of Denmark's electricity consumption must be covered by wind power
 - By 2035, the use of fossil fuels for heat and electricity must cease
 - By 2050, Denmark must be independent of fossil fuels
- Denmark has a lot of wind energy.
- Denmark has know-how within FCH technologies.

Wind power is an important source of energy

2015



2035



Electricity consumption



Electricity generation from wind turbines

The PSO Agreement in Denmark

- PSO (Public Service Obligation) A tariff introduced in 1998 and revised in 2005 on all electricity bills. Used for financing the green transition through e.g. fixed prices on renewable energy and for support for R&D and Deployment of demonstration projects in the energy sector
- PSO was the source of ForskEL supporting the Hybalance project.
- In December 2016 the Danish parliament reached an agreement to phase out the PSO between 2017-2022.
- In 2017, 1 mia DDK (133,3 mio €) is lifted off, with less or similar amounts the following years until 2021

The PSO agreement in Denmark

- The Danish energy ministry

"The agreement creates certainty about the financing of Denmark's green transition [and] strengthens the competitiveness of Danish industry, giving the Danes a cheaper electricity bill and paves the way for using more green power in Danish society,"

- Beyond 2022, finance for renewable projects will be included in the Danish government's budget.

Hydrogen in the Danish transport sector

- Denmark is the first and only country in the world to have a national network of hydrogen refueling stations.
- Denmark has 10 hydrogen refueling stations
- Hydrogen cars are exempt from taxes until 2019.
- 68 hydrogen cars have been registered in Denmark (2016)- Mainly public organisations and municipalities



The first shared hydrogen car in Denmark

- The municipality of Mariagerfjord, Hydrogen Valley and two Toyota dealers have together decided to lease the Toyota Mirai
- The hydrogen car is used as branding purposes and for promoting the municipality's focus on hydrogen
- The car is also used to create attention around the technology and the future of environmentally friendly means of transportation



The potential of the HyBalance project

- HyBalance will establish the experience on how hydrogen can contribute to making Denmark independent of fossil fuels
- The production is estimated to be enough for 1,000 hydrogen cars.
- Production for hydrogen busses and forklifts as well.
- Assumptions
 - More hydrogen busses and cars will be rolled out in Denmark
 - More hydrogen refueling stations will be build to meet the demand from more hydrogen cars.

The HyBalance site



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Thank you for your attention



hybalance.eu



HyBalance

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HyBalance video



Lars Christian Lilleholt, cut the first sod